Study of Germination Percentage and Fungal Infections in Brinjal, Cucumber, Okra, Ridge gourd, Tomato and Watermelon seeds

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***Abstract*- The germination percentage and susceptibility to fungal infections in seeds are critical factors that influence crop productivity and overall plant health. The present study investigates the germination percentage and occurrence of fungal infections in brinjal, cucumber, okra, ridge gourd, tomato and watermelon seeds. The study aims to provide valuable insights into the germination potential and fungal resistance of these important vegetable crop seeds. A total of 100 seeds from each crop were evaluated for germination percentage and fungal infections. The seeds were obtained from reliable seed suppliers and were processed and tested under controlled laboratory conditions. The findings of this study can help farmers, agronomists, and seed producers to make informed decisions regarding seed quality and disease management strategies.**

***Keywords*: Fungal infection, Germination percentage, Brinjal, Cucumber, Okra, Ridge gourd, Tomato, Watermelon**

INTRODUCTION

1.1 Background

The germination percentage of seeds is an essential parameter for assessing seed quality and determining potential crop yields. Additionally, fungal infections can significantly affect seedling establishment and crop productivity. Understanding the germination capacity and fungal infection incidence in seeds is crucial for improving crop management practices and disease control strategies.[1,2,3,4]

1.2 Research Objectives

The primary objectives of this study are:

a) To evaluate the germination percentage of brinjal, cucumber, okra, ridge gourd, tomato and watermelon seeds
b) To determine the occurrence and prevalence of fungal infections in the tested seeds.
c) To compare the germination percentages and fungal infection rates among the selected crop species.

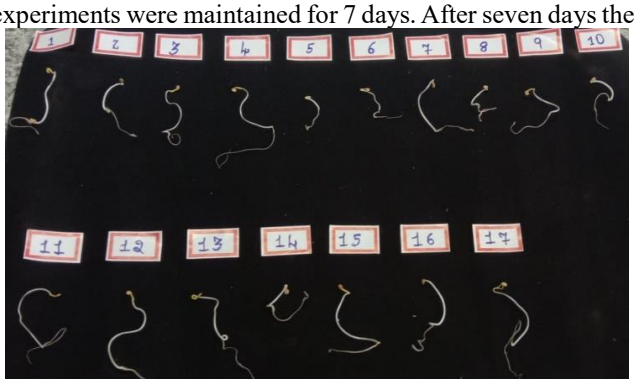
MATERIALS AND METHODS

2.1 Seed Collection

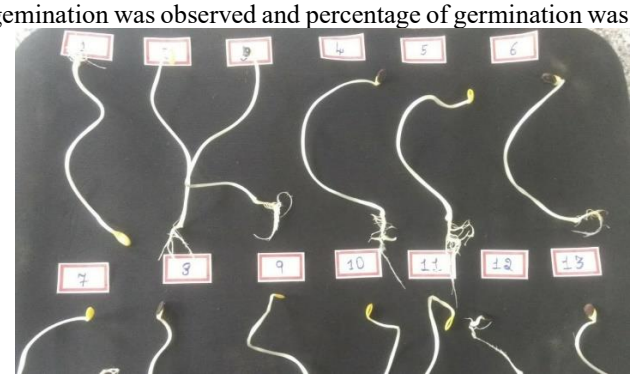
Seeds of brinjal, cucumber, okra, ridge gourd, tomato and watermelon were collected from IIHR, Bengaluru.

2.2 Germination Percentage Assessment

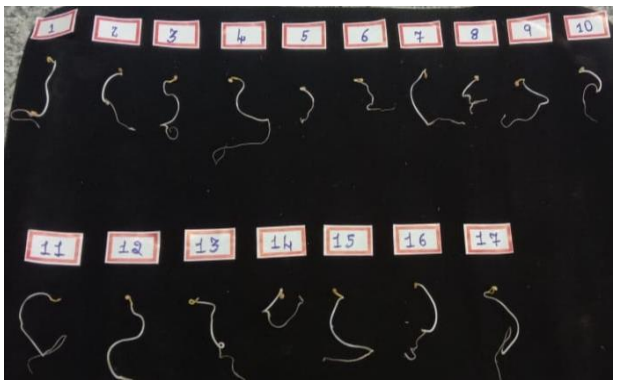
Seeds of brinjal, cucumber, okra, ridge gourd, tomato and watermelon were surface sterilised with 0.2% sodium hypochlorite following by washing in distilled water and drying in the hood of laminar air flow. The seeds were then arranged on the blotting papers in the petriplates according to standard blotting method. Drops of water were added daily to maintain moisture content. The experiments were maintained for 7 days. After seven days the gemination was observed and percentage of germination was assessed.



(a) Germination in tomato seeds



(b) Germination in water melon seeds



(c) Germination in brinjal seeds

Fig 1: Germination in Brinjal, Tomato and Water melon seeds

2.3 Fungal Infection Analysis

After seven days the fungal colonies growing on the seeds were mounted using lactophenol cotton blue method and identified with the help of direct microscopy. The incidence of fungal infections was determined by dividing the number of infected seeds by the total number of seeds tested.

2.4 Statistical Analysis

The percentage of germination and infection was calculated by using formula:

% Germination or Infection = No. Of seeds germinated or infected ÷ Total no. Of seeds × 100

RESULTS AND DISCUSSION

The results of the germination test revealed variations in the germination percentage among the different crop seeds. The germination percentages were recorded as follows: ridge gourd (83%), tomato (78%), brinjal, cucumber (72%), okra (87%), and watermelon (69%). These differences may be attributed to variations in seed quality, genetic factors, and environmental influences.[5,6,7]

Table 1: Germination percentage of brinjal, cucumber, okra, ridge gourd, tomato and watermelon seeds

Sl.no	Seeds	% of germination
1	Brinjal	72%
2	Cucumber	72%
3	Okra	87%
4	Ridge gourd	83%
5	Tomato	78%
6	Watermelon	69%

Fungal infection analysis demonstrated varying levels of susceptibility among the tested seeds. Ridge gourd and cucumber seeds exhibited the highest prevalence of fungal infections, with 35% and 40% infection rates, respectively. The most common fungal pathogens isolated from these seeds were *Alternaria* spp. and *Fusarium* spp. Brinjal, tomato, okra, and watermelon seeds showed comparatively lower infection rates (0%, 20%, 17%, and 25%, respectively) and were primarily affected by *Aspergillus* spp.[8,9]

(a) Cucumber seeds

(b) Okra seeds

(c) Ridge gourd seeds


(d) Tomato seeds


(e) Water melon seeds


(f) Brinjal seeds

Fig 2: Germination and fungal infection in brinjal, cucumber, okra, ridge gourd, tomato and watermelon seeds

Table 2: Infection percentage of brinjal, cucumber, okra, ridge gourd, tomato and watermelon seeds

Sl.no	Seeds	% of infection
1	Brinjal	0%
2	Brinjal, Cucumber	40%
3	Okra	17%
4	Ridge gourd	35%
5	Tomato	20%
6	Watermelon	25%

The findings suggest that ridge gourd and cucumber seeds are more susceptible to fungal infections compared to brinjal, tomato, okra, and watermelon seeds. The variation in susceptibility may be attributed to differences in seed characteristics, seed coat thickness, and inherent resistance mechanisms. The presence of fungal pathogens in the seeds emphasizes the importance of implementing appropriate seed treatment methods to minimize disease transmission and promote healthy seedling establishment.[10,11]

CONCLUSION

The results of this study provide valuable insights into the germination percentage and fungal infections in ridge gourd, tomato, brinjal, cucumber, okra, and watermelon seeds. The variations observed among these crops highlight the importance of seed quality assessment and disease management practices in agricultural production systems. Seed treatments and cultural practices targeted at reducing fungal infections should be employed to enhance crop establishment and optimize yields. Further research is warranted to explore additional factors influencing seed germination and fungal infections

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